

Section 6.1

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1 Safety Precautions

1.1 General

When operating the ADC COMPACT System, you should always make sure, that the following safety checks have been taken before bringing the ADC COMPACT System into use:

- Make sure that the various components of the ADC COMPACT System are installed in places where they can be constantly observed.
- Do not bypass or disable any incorporated safety features.
- Always disconnect any components of the ADC COMPACT System from the mains before carrying out service or maintenance.
- Troubleshooting, or electrical or mechanical repairs, may only be carried out by qualified service personnel.
- AGFA-Gevaert reserves the right to modify and improve their equipment in order to adapt them to the latest technical standards.

There are no user-serviceable parts inside the ADC digitizer. Perform no other operations on the digitizer than the ones described in the ADC COMPACT BASIC SYSTEM manual.

1.2 Digitizer



The ADC COMPACT digitizer makes use of approx 25mW HeNe laser, classification class IIIb.

In normal operating conditions, when both doors are closed, there can't be any laser radiation outside the unit. It is nonetheless imperative that the local radiation safety regulations regarding the protection of staff against scattered radiation are complied with, if the ADC COMPACT Digitizer is located in the immediate vicinity of an X-ray room.

For laser safety, only open up the front left and right doors as described in the user manual to solve possible cassette or image plate jams. When the doors are opened, the main power supply is automatically disconnected to prevent laser radiation.

1.3 Cassettes

Observe great care whenever removing the image plate from the ADC COMPACT cassette. Refer to the cleaning procedure described in the user manual.



Make sure that the automatic exposure control device is placed above the cassette, to prevent patients from receiving an overdose of X-rays. When it is located underneath the cassette, the backscatter protection (lead) contained in the red side of the cassette, retains a certain amount of X-rays. The dose measured by the cell will then be much lower than the dose actually given to the patient.



The image plate causes a specific X-ray scattering. This influences the response of the exposure control device. To compensate for this, recalibration of the device for the use with ADC COMPACT cassettes could be necessary.

2 Safety Notes ADC Compact Digitizer

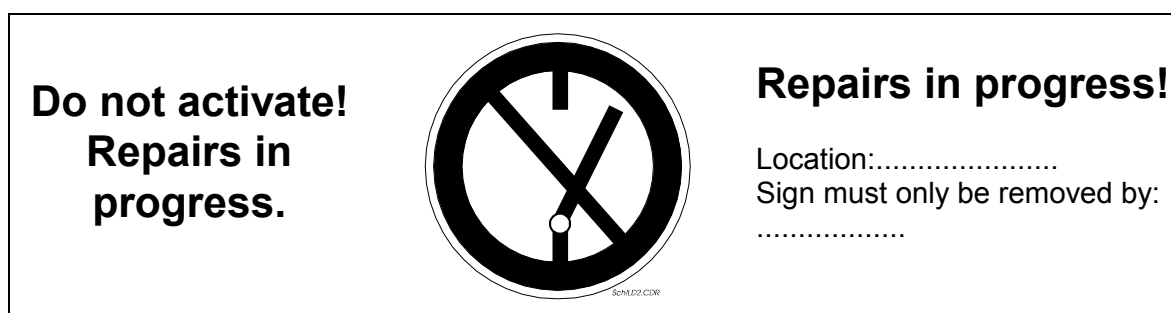
2.1 General

With every repair work check the following points visually:

- Condition of the insulation of the mains plug / mains cable
- Effects of the strain relief for the mains cable
- Efficiency of the protective earth on metal panel parts (protective earth connected and spring contacts OK)
- Correct condition of the protection covers

2.2 To be considered upon Repairs on the ADC Compact

The machine must be protected against accidental activation during repair work. For this purpose we recommend to attach the following sign on the main switch while repairing the machine.



2.3 High Leakage Current

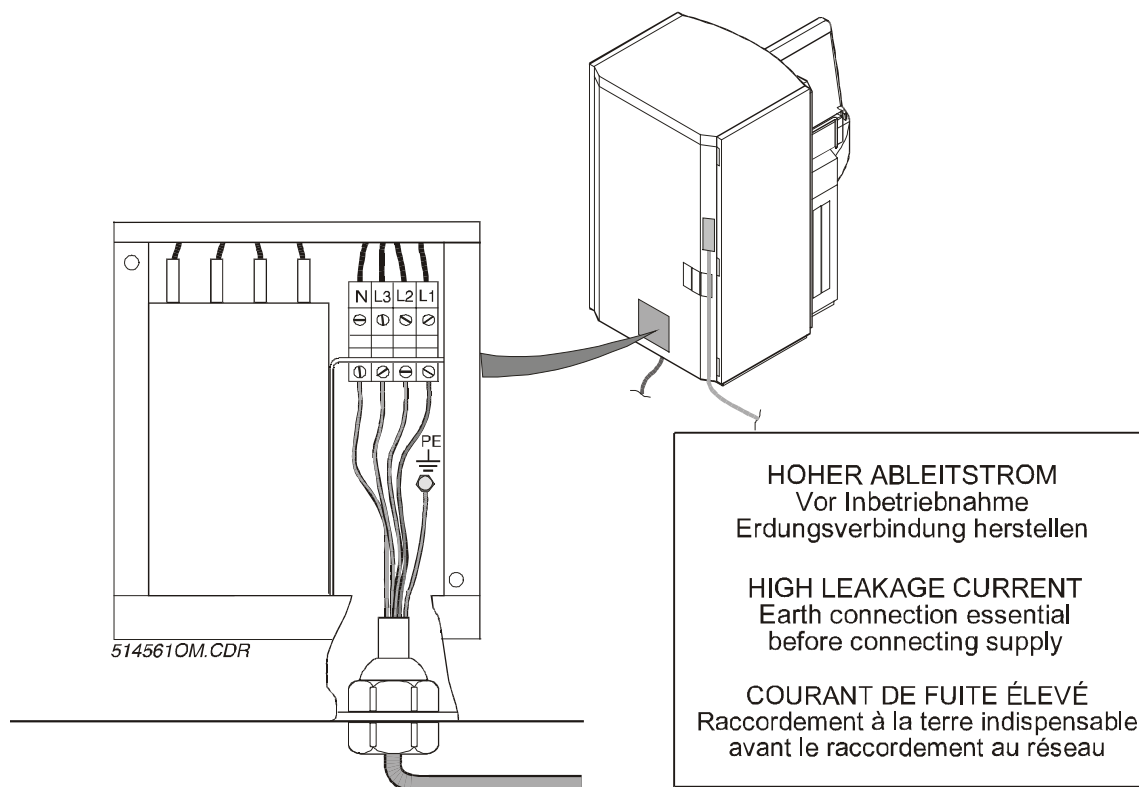


Figure 1

2.4 Safety Switch of the ADC Compact Digitizer

The machine has one safety switch to ensure the customer's safety:

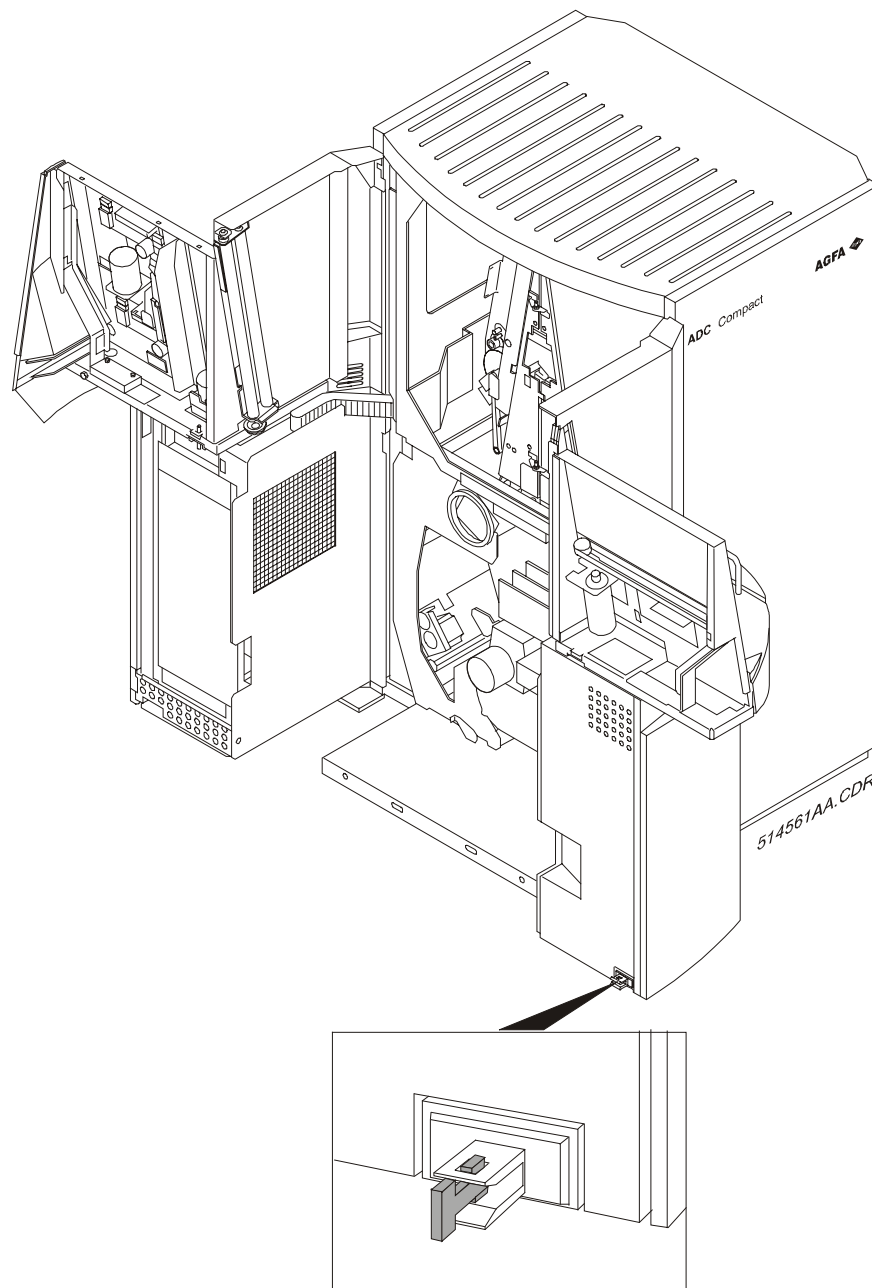


Figure 2

The mains voltage is interrupted when the Digitizer is opened.



For service purposes this function can be overridden by means of a service key. However, be careful since there is a risk of injury by moving mechanical parts, electrical parts as well as the laser beam.

Consider that the service key must be removed again before the doors are closed. After use of the service key, the function of the safety switch has to be checked.

2.5 Safety Regulations for the Laser Beam

This machine corresponds to the category Class 1 Laser Product. The corresponding label is located behind the side panel below the mains switch, see illustration..

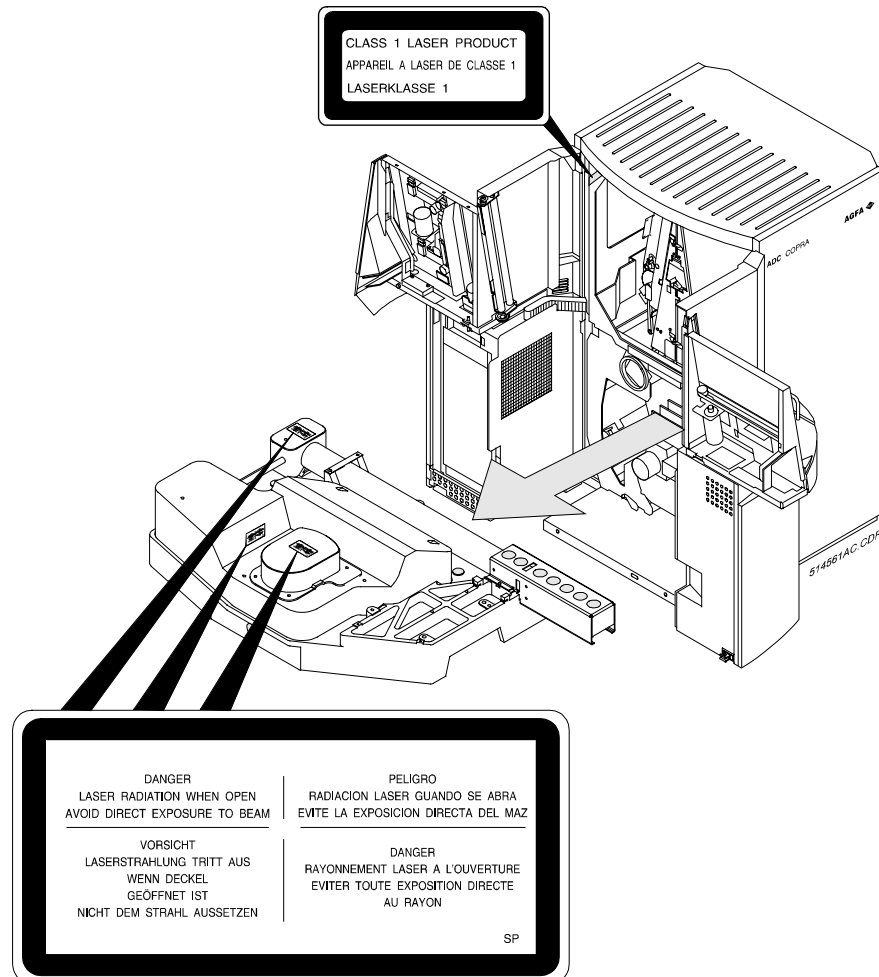


Figure 3

Avoid direct exposure to laser beam.

Do not hold any tools into the laser beam (risk of reflection).

During any service interventions concerning the optical path the digitizer must be switched off (replacement of rotating shutter, galvo, pin diodes board or laser).



When checking the optical path laser goggles have to be put on (CM+9.9999.1547.0).

Take care to:

- avoid reflections
- check if all components concerning the optical path are installed properly.

2.6 Protective Measures for Electronic Components

Since there is a frequent problem with electrical components which are destroyed by static discharge, protective measures must be taken to avoid this problem. For the repair on electrical components it is necessary to wear the grounding strap around the wrist and connect the other end of this strap on a position of the frame which is free of lacquer.

Be attentive, that the frame is grounded!

This grounding strap is available under the spare part number CM+9.9999.0830.0 via LOG-T warehouse in Munich.

2.7 Warning Label on the Input Buffer of the Digitizer

The warning label (see Figure 4) is placed in the upper left corner of the front side of the Input buffer; details see Figure 5.



Figure 4: Warning label (25mm x 25 mm)

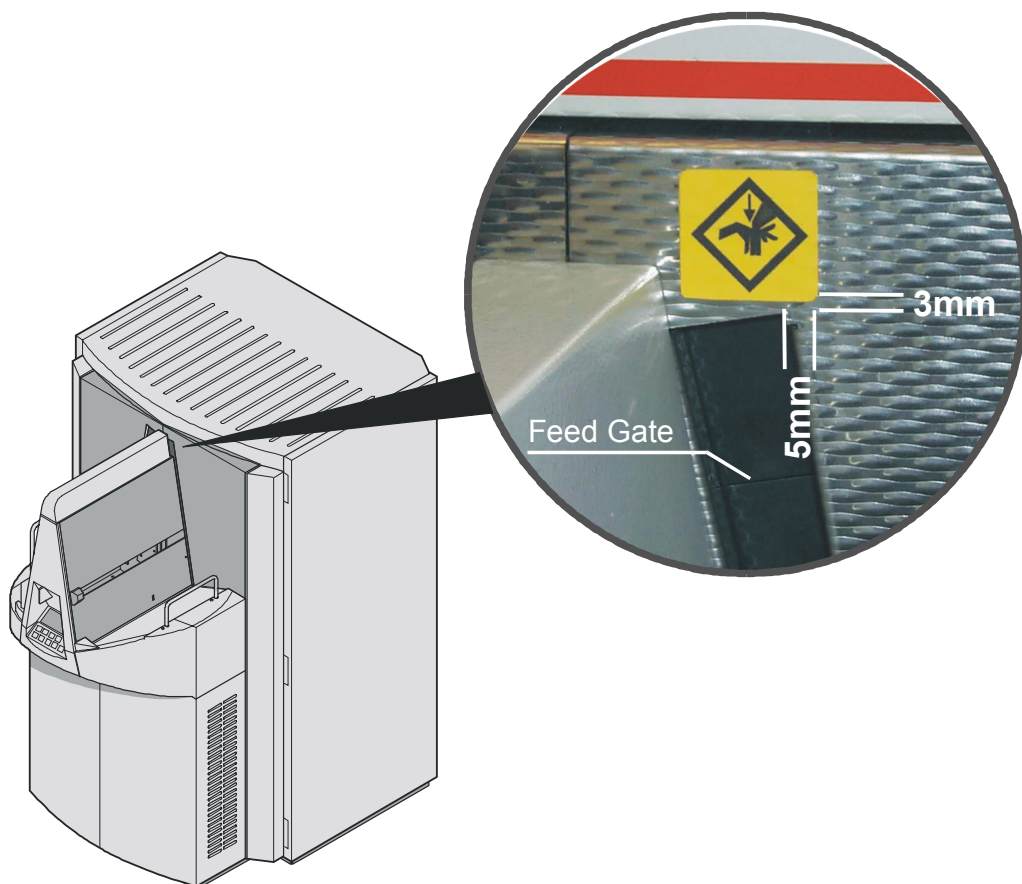


Figure 5: Label position

2.8 Warning Label on the Erasure Unit

The Erasure Unit gets extremely hot during the operation. Avoid contact, there is a risk of burning. Watch the corresponding label, see figure.

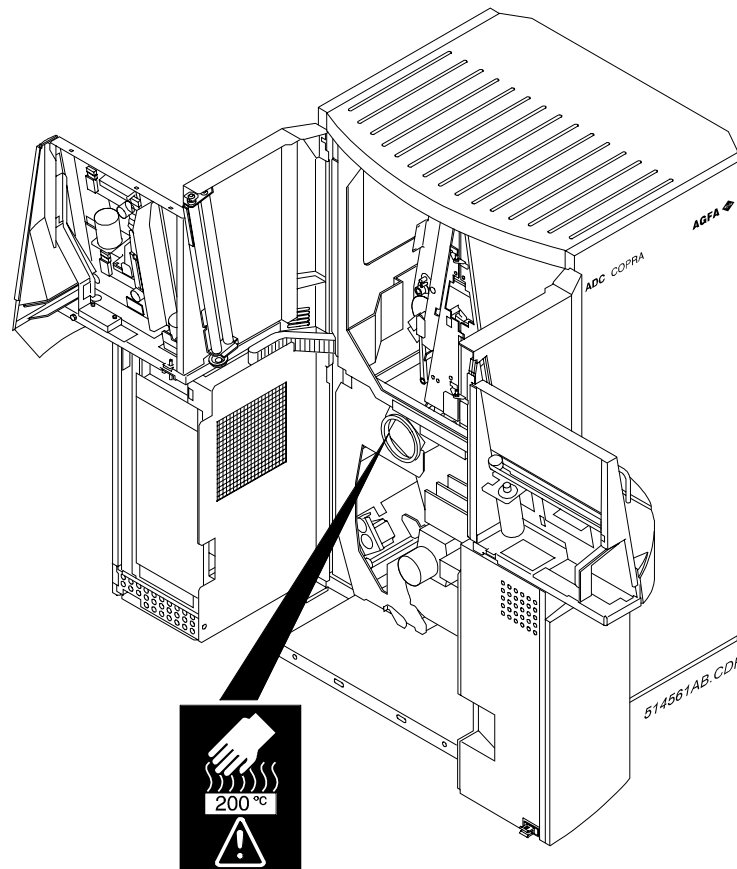


Figure 6

2.9 High Voltage Power Supply of the Laser

The power supply for the laser is provided by a high voltage power supply. Before disconnecting the high voltage cable always disconnect the mains cable first. After removal of the high voltage cable shorten the power supply with well-insulated cables in order to discharge the smoothing capacitor.

2.10 Safety Regulations for the Battery Replacement in the GEMINI CPU and the TAG Reader



- Incorrect battery replacement involves the risk of explosion. Consider the correct polarity.
- Only use batteries of the same type or an equivalent type as specified by the manufacturer.
- Dispose of empty batteries in compliance with the specifications of the manufacturer.

2.11 To be considered with mechanical Tests of Stepper Motor controlled Drive Units

If a stepper motor driven shaft must be turned for checking a mechanical function, make sure to disconnect the stepper motor first on the corresponding control board. (To avoid destruction of the stepper motor control board by induction).

If this is not possible, turn the stepper motor only slowly.

2.12 Position of the Type Label

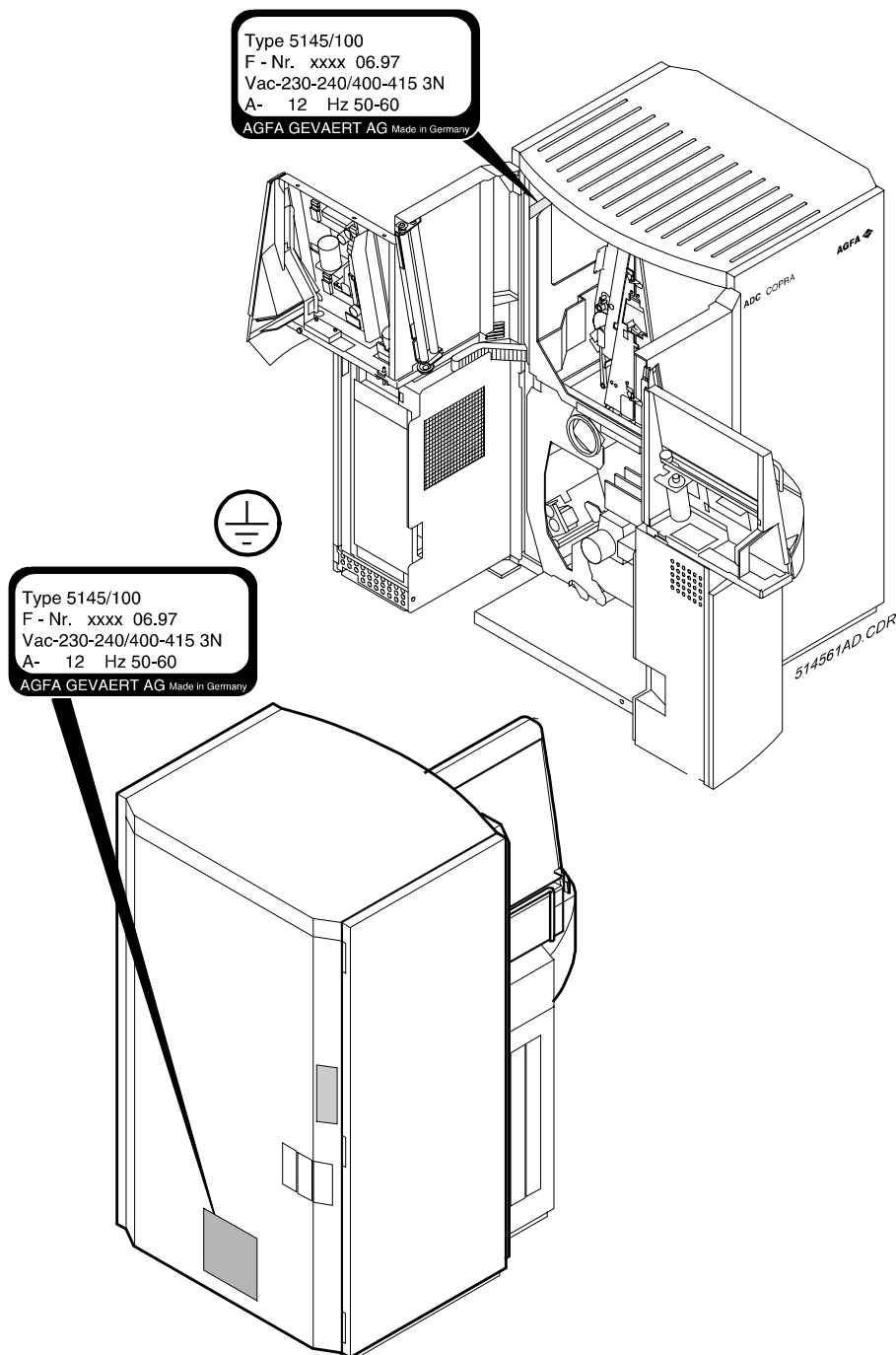


Figure 7

3 Short Circuit Risk at the Power Unit of ADC COMPACT Digitizer (I)

Upon opening / closing of the metal door at the power unit, mains voltage cables may be clamped between the hinge and the housing.

This results in damage of the cables.

- The consequence may be a short circuit.
(blown mains fuses)
- Touching the damaged cables is dangerous (electrical shock) after opening the door of the power unit!

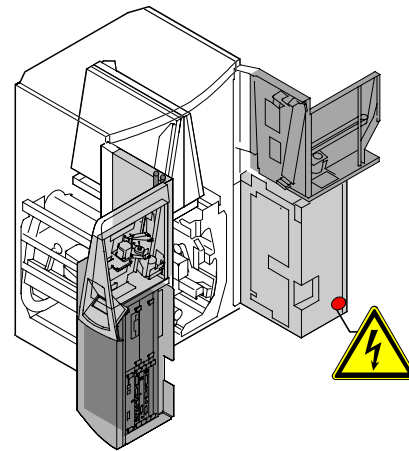
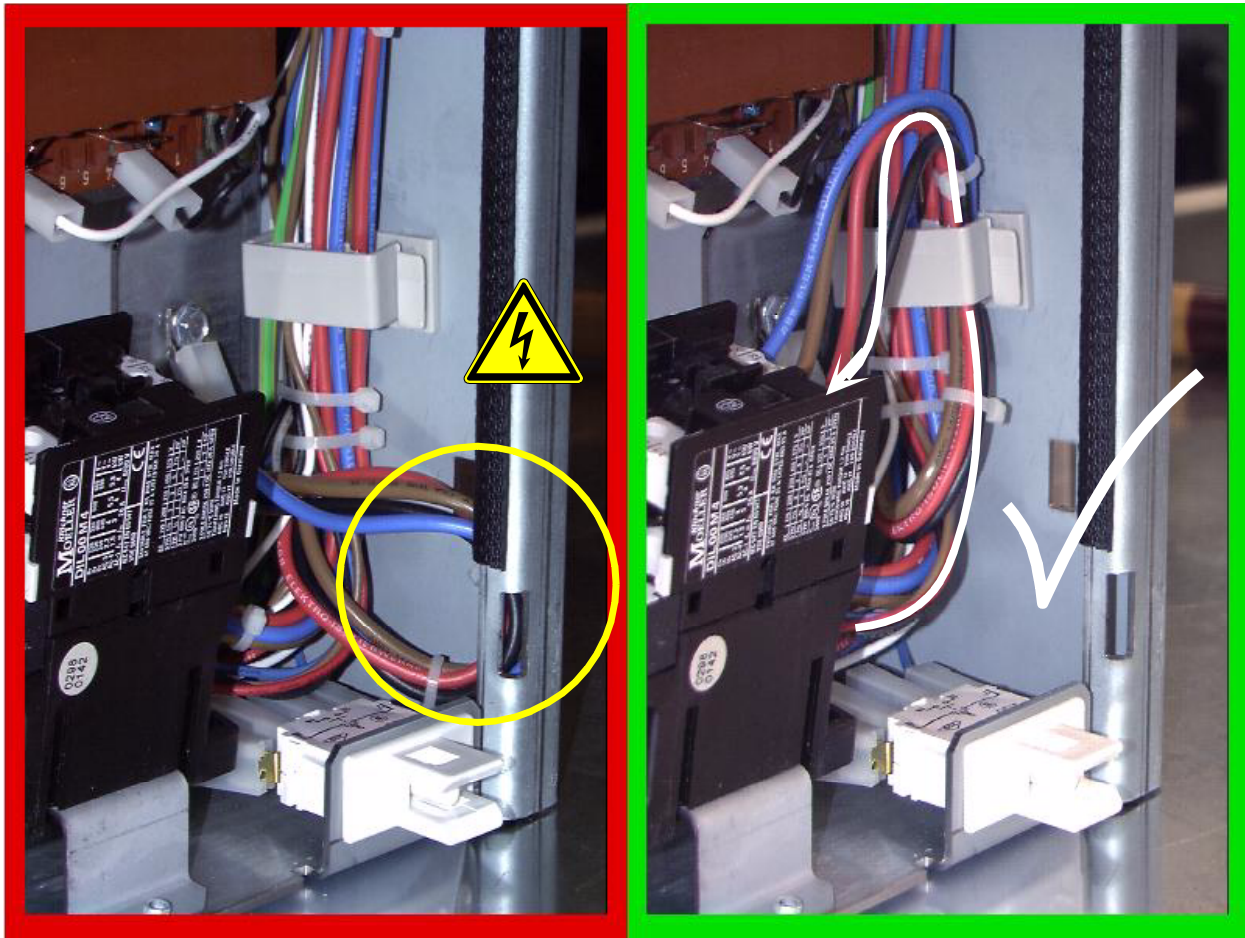


Figure 8

The following measures must be carried out:

1. Check all cables in the respective area for damage.
Damaged cables must be repaired immediately.
For detailed information refer to next page.

2. Fix the cables by means of a cable clamp.
For detailed information refer to next page.



Kabel.cdr

Figure 9 a)

9 b)

Figure 9a
exposed cable harness**Figure 9b**
new positioning of the cable harness

Check all cables in the respective area for damage, see circular mark in Figure 9 a)

The following points must be considered upon repair of the damaged cables:



- The insulation of the connection must be of the same quality as before. In this case "simple insulation".
- The connection must not open up in case of problems.

Repair of damaged cables:

- Disconnect Digitizer from mains.
- A soldering connection is permitted, even soldering of a braided wire "in-between". The complete repaired position must be insulated with a shrinking tube. The shrinking tube also serves another purpose, the connection cannot open up mechanically in case of the above mentioned problem.
- The solder connection may also be insulated with an insulation tube, and in addition the insulated position must be secured on both ends by means of cable ties.
- Another possibility is to crimp a plug connection to both ends and then to insulate the repaired position. Again, make sure to fix the repaired position with the insulation.

Position the cable harness further up and fix it with the available cable clamp, see Figure 9 b)

4 Short Circuit Risk at the Power Unit of ADC Compact Digitizer (II)

Problem

Short Circuit Risk in the ADC COMPACT Digitizer

Reason

Possible Insulation defect at the auto transformer



It is possible that under certain circumstances the insulation of the mains input of the Auto transformer might become defective.

IT IS MANDATORY TO INSPECT AND MODIFY ALL MACHINES (up to SN 5069) BEFORE INSTALLATION. YOU MUST NOT POWER ON BEFORE INSPECTION / MODIFICATION. INSPECT AND MODIFY ALL ALREADY INSTALLED DIGITIZERS.

Concerned machines: 5145/140 ≤ SN 5069

From SN 5070 on the mounting bracket of the capacitor is about 12mm lower. Also a plastic cap on the capacitor bolt is introduced as series standard.

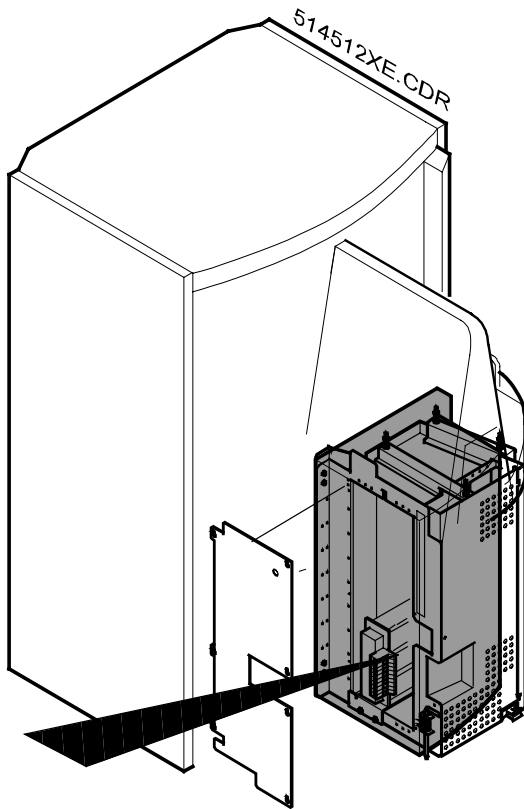


Figure 10

Inspection procedure before installation

1. Open the left and the right door of the digitizer.
2. Loosen the mounting screws of the Auto transformer compartment cover as shown in figure 1 (You don't need to remove the screws).
3. Remove the cover.
4. Inspect the mains cable of the Auto transformer for possible damages.
5. Repair if necessary
6. Apply the modification

Inspection procedure for already installed machines

1. Shut down and switch off the digitizer.
2. Disconnect the machine from the mains

NOTE: Wait about 10 minutes for discharging the internal capacitors

3. Open the left and the right door of the digitizer.
4. Loosen the mounting screws of the Auto transformer compartment cover as shown in figure 1 (You don't need to remove the screws).
5. Remove the cover.
6. Inspect the mains cable of the Auto transformer for possible damages.
7. Repair if necessary
8. Apply the modification

Solution

If the Transformer cable is damaged, perform the following steps:

- a) Loosen the Auto transformer and pull it carefully in the position as shown below. Be sure that the transformer cannot drop down (its weight is enormous!).



Figure 11



Do not loosen any cable of the auto transformer!

- b) Put an insulation tape (PVC, min.1500V, Strength 0.17mm, e.g. Order Nr. CM+7.0479.1201.0) over the defective insulation part as shown below.

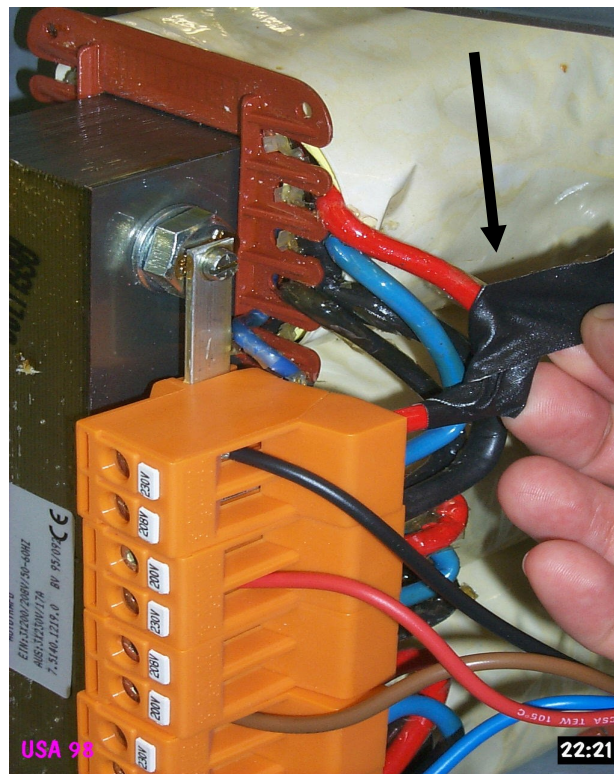


Figure 12

- c) Push the Auto transformer back at its place and tighten the mounting screws.
- d) Fix the concerned cable in a position away from the capacitor bolt.



If you have to replace the transformer, be sure to follow the local security regulations.

Preventive Measure:

1. Remove the nut of the large capacitor (see Figure 13).
2. Put the two washers (CM+7.0205.022.24) on the bolt of the capacitor as shown in Figure 14.
3. Tighten the nut firmly.
Be sure, that no abrasive part of the capacitor-bolt remains outside.
4. Fix the concerned cable in a position away from the capacitor bolt.
5. Close the cover and tighten the mounting screws.
6. Close both doors of the digitizer and reconnect it to the mains.
7. Now the digitizer is ready to operate.

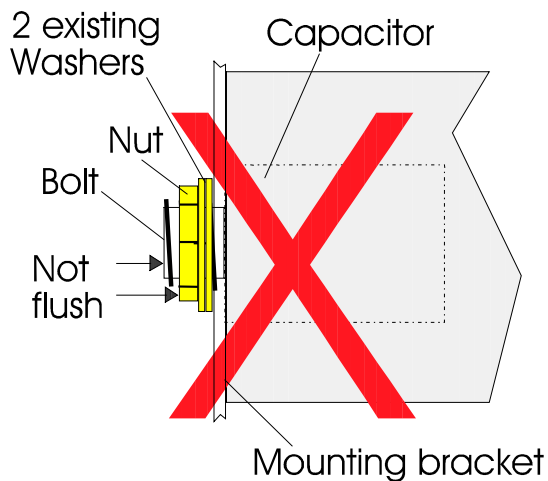


Figure 13

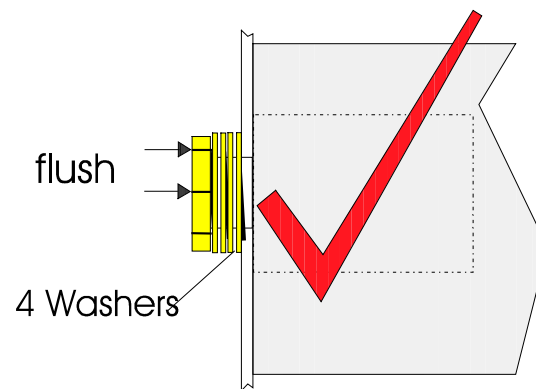


Figure 14